

NOTES ON AFRICAN CHALCIDOIDEA—IV.

By JAMES WATERSTON, B.D., B.Sc.,
Imperial Bureau of Entomology, London.

TIMIODERUS, gen. nov.

♀. The entire integument of the head and body metallic and shagreened, or highly raised reticulate; the abdominal tergites being a little smoother. *Head* in profile triangular, from above somewhat thin, shallowly concave across the frons, rounded behind the eyes from vertex to genae; but medianly, behind the raised ocellar triangle, there is an inconspicuous ridge before the occiput; from in front, exceedingly wide, the scrobes set close together in the middle of the face, well above the base line of the bare eyes. Labrum long, spade-shaped, conspicuous; mandibles similar, bidentate, a little asymmetrical. *Antenna* thirteen-jointed, with simple cylindrical joints; the divisions of the club indistinct. *Thorax* much swollen; pronotum almost concealed behind the head; nearly separated into two tergites; prosternum posteriorly truncated, triangular; mesonotum with the parapsidal furrows fine and hardly traceable. Axillae quadrate, touching, or only separated narrowly (?). Scutellum with a transverse suture before the unarmed, rounded apex; mesopleural femoral furrow well-marked, and the prepectus rather large. *Wings*: forewings with the post-marginal almost obsolete; radius very short, with a terminal group of clear cells instead of the usual linear arrangement. Hind wings with the submarginal cell long and wide. *Legs*: fore coxae long; hind tibiae bicalcarate without apical comb. *Abdomen* sessile or practically so; broad, depressed and broadly concave above; very shortly carinate (basal one-third) below. The first tergite (which with ii. and iii. is posteriorly, medianly notched), covers three-fourths of the surface; tergite ii. reaches the edge; the third is on the edge; while tergites iv., v., vi., vii. are all *ventral* in position. The ovipositor is broad, stout, with strong teeth on the needles and central piece.

Timioderus refringens, sp. nov. (figs. 1, 2, 3).

♀. A dark metallic blue or emerald green species, refringent on every part of head, thorax and abdomen. The ground colour of head and thorax is blue overlaid with green or bronzy green. The purest blue appears on a broad central line on the mid lobe of the mesonotum, and again on the apex of the scutellum beyond the suture. Antennae dull black, the scape browner and paler beneath. All the coxae are blackish brown, except on outer aspect, where the metallic tints of the thorax are reproduced; all femora blackish brown, non-metallic to about one-sixth before the apex, the apices of tibiae and tarsi pale; the tarsi are slightly infuscated towards the apex and the claws are blackish brown.

Head (fig. 1, *e*) nearly twice as broad as deep (17 : 9). The distance between the orbits across the middle of the face over four times an eye diameter. Scrobes almost circular; exactly in the middle of the face, and separated by less than the diameter of either. Distance between the lateral ocelli over one-third of that between the eyes across the vertex. Post-scapal depression broad and shallow, with no definite margins. Below the scrobes and above the mouth-edge the face is somewhat raised ;

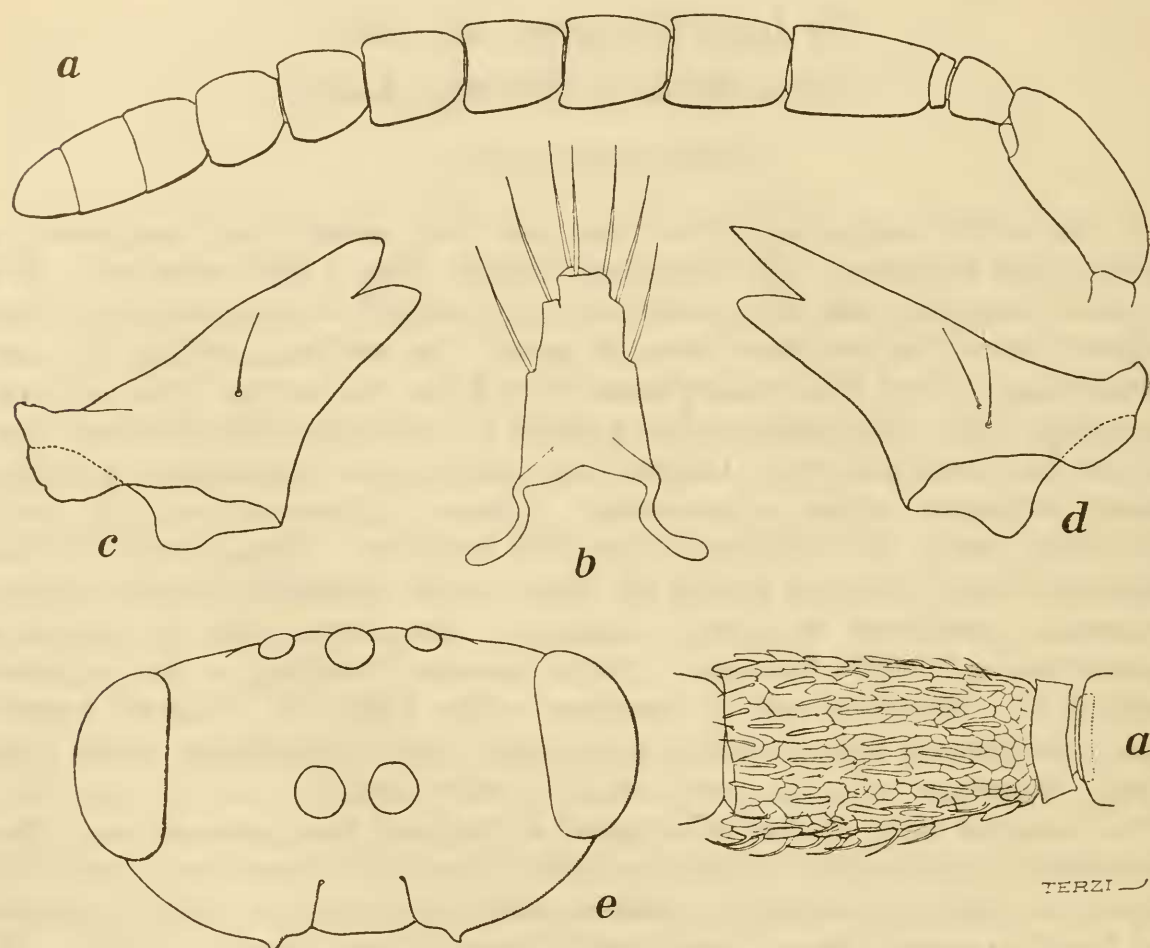


Fig. 1. *Timioderus refringens*, gen. et sp. n., ♀; *a*, antenna, and enlargement of ring joint and first funicular; *b*, labrum; *c*, right mandible; *d*, left mandible; *e*, head from in front.

on this area (as well as on the occiput) the sculpturing tends to form concentric striae and rugae, elsewhere it consists of highly raised coarse reticulations. Mouth-edge concave; twice slightly sinuate at the sides, and with middle broadly and gently convex. *Antennae* (fig. 1, *a*): length, 1.9 mm.; scape short and broad (7 : 3); pedicel (2 : 3) two-sevenths of the scape; funicle, 20, 16, 14, 13, 13, 12, 12; club (indistinctly septate) 8, 11, 9; breadth of both, in the same ratio, 12. The sensoria on the funicle and club are very numerous. In some the blade is free, in others almost entirely adherent. *Mouth-parts*: labrum (fig. 1, *b*) long, truncate, with apically convergent sides, and bearing the spiny bristles figured. Mandibles (fig. 1, *c*, *d*) stout, narrow, the teeth on the right one subequal, broad, though pointed; the lower tooth of the left acute.

Thorax (fig. 2, *a*): the strongly sculptured integument shows a fairly regular pattern on back and sides. The lateral suture between the axillae and side lobe of mesonotum forms a smooth wedge. There are traces of transverse rugae across the femoral impressions on the mesopleurae, and the mesosternum is medianly almost smooth; but the parapsidal and axillary sutures are very fine, and only

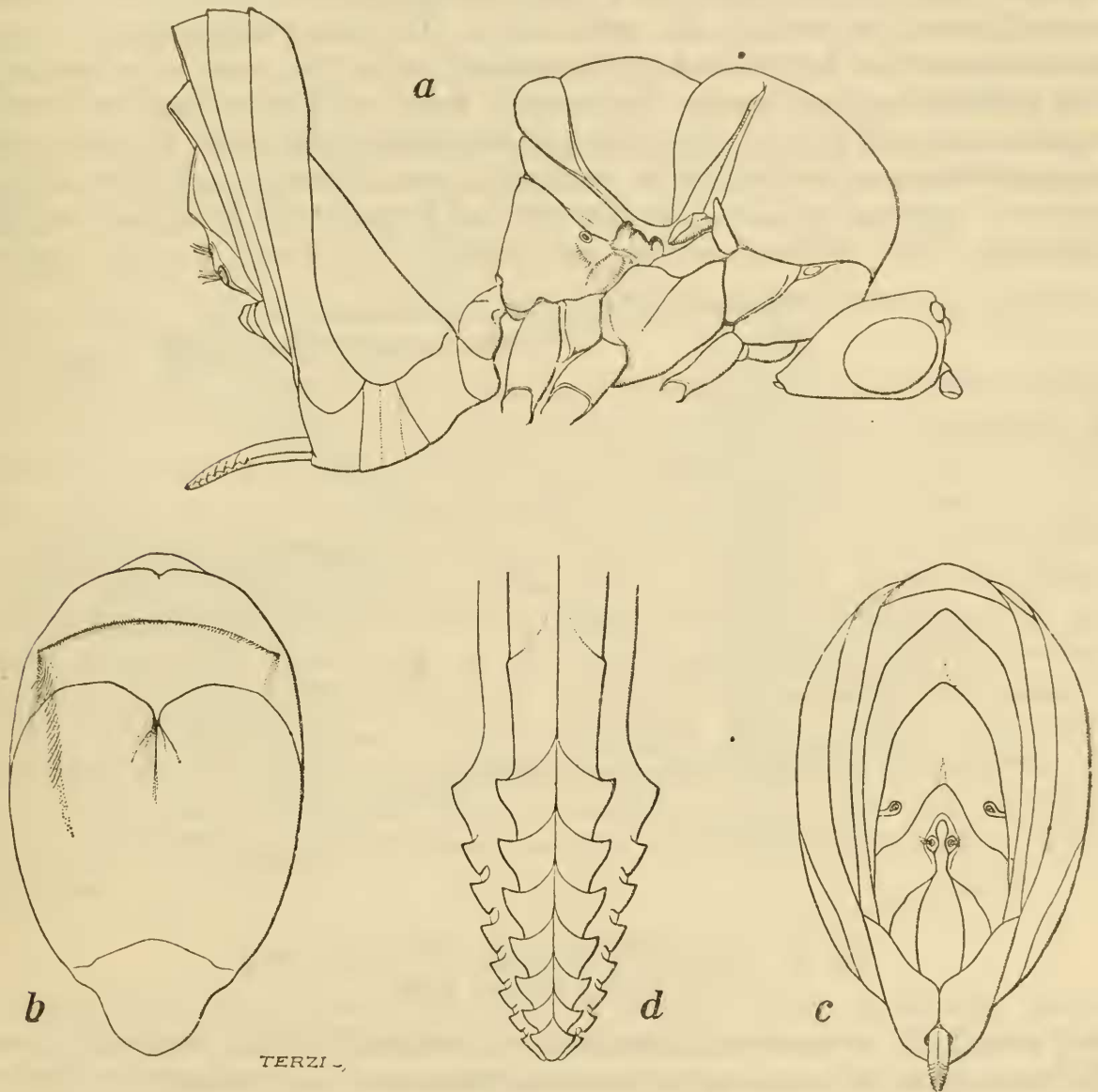


Fig. 2. *Timioderus refringens*, ♀; *a*, body, side view; *b*, abdomen from above; *c*, abdomen from below; *d*, ovipositor.

partially decipherable. Directly from above the protergites are invisible. The mesonotum before the suture is heart-shaped; the parapsides are distinctly invaded by the quadrate axillae. The scutellum is long, two-thirds of the mid lobe, overhanging the propodeon, but rounded and not developed into a process. The propodeal spiracle is small, circular, and placed far down on the pleurae, and anteriorly facing the metanotum.

Metathorax medianly rounded and sculptured like the notum of the mesothorax ; the side-pieces are rather deeply sunk and transversely ridged, but without any boundary between them and the central piece.

Fore wings (fig. 3, *a*) almost triangular, over two and a quarter times as long as broad. Length, 3.8 mm. ; breadth, 1.6 mm. Submarginal : marginal : radius : post-marginal, as 16 : 7 : 1 : 1. Pubescence of the wing fine and dense to below the marginal vein. Basal triangle and a narrow tapered space along the hind margin (ending before the level of the radius) bare. The long submarginal cell bears numerous short fine bristles, and on the marginal vein are two more or less complete rows of feeble fugacious bristles ; the marginal, radius and post-marginal are densely set with short stiff bristles. Both marginal and radial veins broad, the latter with a group of eleven to twelve pustules terminally, none of them projecting beyond the margin of the vein (fig. 3, *b*). The post-marginal is represented by a short, tapered thickening with indistinct outline, but certainly not longer than the radius.

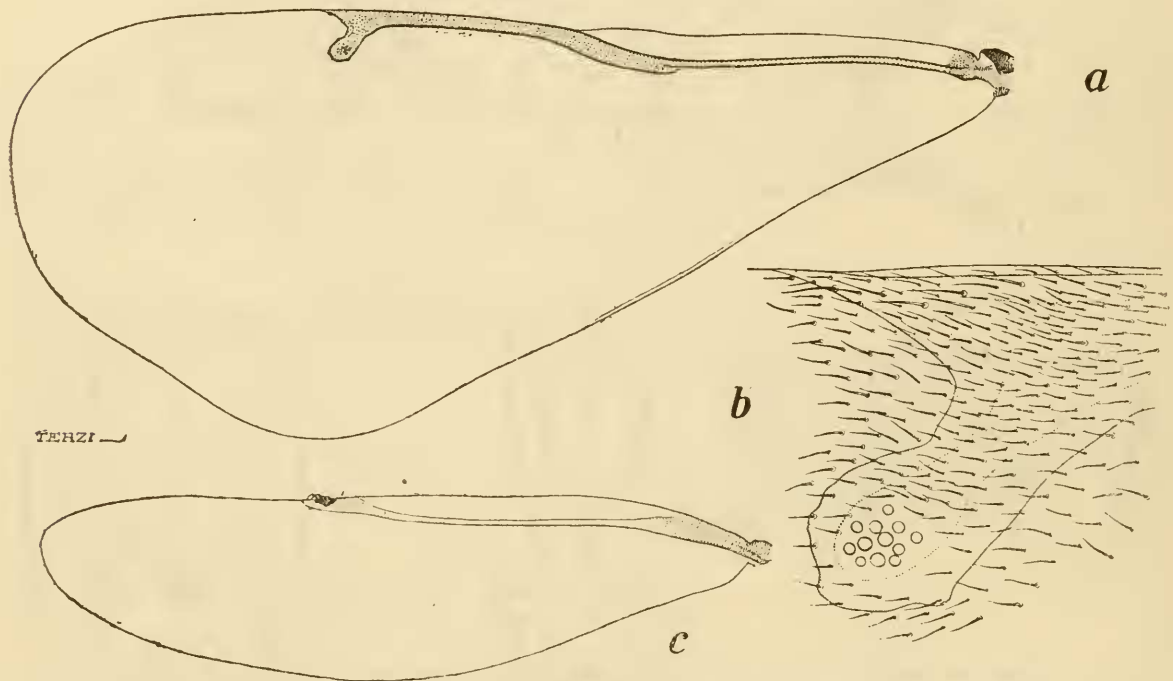


Fig. 3. *Timioderus refringens*, ♀ ; *a*, fore wing ; *b*, radius ; *c*, hind wing.

Hind wing (fig. 3, *c*) four times as long as broad ; length, 2.8 mm. ; breadth, 0.7 mm. The submarginal cell extending to the hooks, pubescent, except narrowly in front of the vein. But for a bare line at the apex, the wing is otherwise evenly pubescent. The frenulum consists of six curved hooks, arching over a patch of short spinose bristles, arranged in three rows of about ten each.

Legs : the outer surface of all the coxae coarsely raised reticulate, like the thorax, etc. ; the inner surface smooth and clad with silvery pubescence towards the apex. The legs are otherwise smooth and pubescent. All the tarsal joints bear apically on the plantar aspect several strong stiff hyaline bristles. Above the insertion of the tibial spurs are 2-3 spines, but neither on the anterior nor on the posterior legs is there any complete transverse row. Similarly, the comb of the first tarsal joint is wanting, though all the bristles on the anterior aspect are thickened and spinose.

The fore femora are somewhat thickened and broadest near the base. In all the tarsi, from the third to the fifth joints (including claw) the proportions are the same, viz. :—4, 3, 11. In all the legs, the first tarsal joint is twice the second. In the fore tarsus, the first joint is one-fifth longer than in the mid or hind tarsi.

Propodeon triangular, truncate, with a slight median keel.

Abdomen sessile, but so narrowed at its insertion as to appear petiolate in side view; abruptly broadened, truncate, in general shape triangular, rounded posterolaterally. The tergites cover all the upper and three-fourths of the under surface as well. All the tergites, especially the first, are posteriorly incised in the middle, and this shows clearly on tergites i. and ii., but on iv. to vii., owing to infolding, the posterior margin of each tergite forms a pointed arch (fig. 2, c). Sixth tergite medianly carinate. Spiracle lateral in position, circular, with a narrow outwardly pointing sulcus. Seventh tergite not carinate. The stylets are nearly touching.

Length, about 5 mm.; alar expanse, over 9 mm.

NYASALAND: Lake Nyasa, Monkey Bay, 3 ♀♀, 1.vi. 1915 (*Dr. W. A. Lamborn*).

Type, a ♀ in the British Museum.

Besides the above there is, in the collection of the Imperial Bureau of Entomology, a complete ♂ labelled Mlanje, Nyasaland, 15.xi.1913, and another fragmentary ♂ (thorax and wings) also from Mlanje, 13.xi.1913, taken by Mr. S. A. Neave, while being preyed upon by an Asilid fly, *Promachus fasciatus*, F., in both cases.

I believe these to be the ♂ of the species described above. In sculpturing the Monkey Bay and Mlanje specimens agree. The ♂♂, however, are generally bluer all over, the abdomen is more distinctly petiolate, and the size slightly less. In the antennae, the scape is practically as dark below as the funicle and club, whose segments are distinct. But, apart from these purely sexual differences, there is evidently nothing to add to the generic definition already given. The genus *Timioderus* has the general facies of those Eucharines which are distinguished by the entirely unarmed scutellum, but the mandibles are of a type very different from that generally found in this family, so that a Perilampine relationship is more probable.

Genus SPILOCHALCIS.

Of this genus, so numerously represented in the New World, particularly Brazil, few species have been described from the Eastern Hemisphere. Excluding the genotype *S. xanthostigma*, Dalm. (1820), from Europe, I know of only three Old World forms; *S. nigrorufa*, Walk. (1853), (described as a *Smicra*), from India; *S. capensis*, Cam. (1907), from the Cape; and *S. libanotica*, Schmied. (1909), from Asia Minor. Probably *Chalcis pensilis*, Klug (1834), from Egypt, should be placed here. From all these, *S. andersoni*, sp. n., may be separated at once by the entirely orange propodeon. In the longer American series such a propodeon is apparently not uncommon; e.g., in *S. erythrina*, Walk. (1861), Mexico, and *S. igneoides*, Kirb. (1883), North America. In the American fauna, however, the yellow and black species greatly preponderate. But of the six Old World forms mentioned here, five are red and black. In *S. andersoni* the basal tooth of the hind femur is remarkably small.

Spilochalcis andersoni, sp. nov. (fig. 4).

An orange red species with black markings.

♂. Antennae blackish brown, the scape paler on the ventral edge. Frons, genae and occiput, at the sides, orange, post-scapal and ocellar areas and the mid occiput black. Mandibles orange-yellow, with the teeth brown. Thorax, abdomen and legs orange, with the following marks:—a broad, median black band extending over all the notum of the thorax, occupying about one-third of the pronotum, and widest anteriorly on the mid lobe of the mesonotum, on which sclerite it is medianly contracted; it covers the suture, but does not invade the side lobes or axillae; after the suture it contracts, and only expands again narrowly above the metathorax. The mesosternum is extensively brownish, and the prosternum less so; the lower two-thirds of the mesopleural femoral furrow, and a spot above the insertion of the

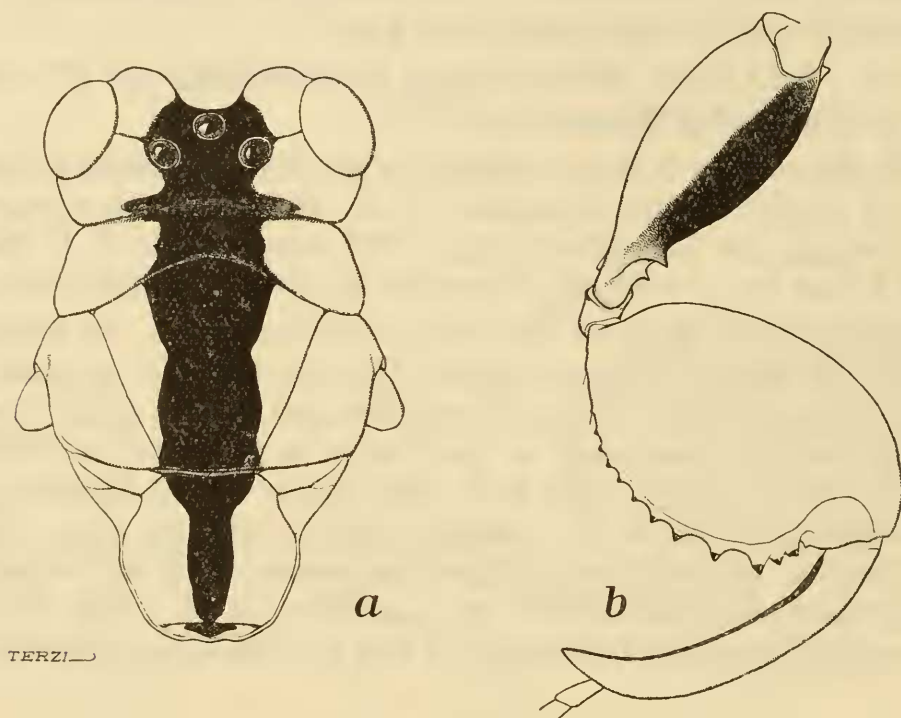


Fig. 4. *Spilochalcis andersoni*, sp. n.; a, head and thorax; b, hind coxa, femur and tibia.

hind coxa, blackish brown. A faint spot outside the fore coxae, the mid coxae entirely, and the hind coxae above, together with the trochanters, brown or blackish brown; teeth of the hind femora and inner superior edge of the tibia, narrowly black; all the tarsi are a little darker apically, and the fore and mid tarsi, together with the tips of the tibiae, are yellowish red. The ground colour of the abdomen is seen principally on the petiole and basal half; towards the end it becomes infuscated. Wings, especially the subcostal cell, and below the marginal, a little brown; the veins brownish black. The general colour of the body pubescence is tawny or orange.

Head: breadth to depth as 7 : 5 (vertex to clypeal edge) or 7 : 6 (to apex of closed mandibles); across the face, three times the diameter of an eye. Clypeus and labrum straight, the latter with eight or nine bristles. Genae shining, finely striate; malar

keel delicate, at first descending almost perpendicularly to below one-half, and then curving forward to the corner of the mouth. Above the clypeus the surface is a little shining, finely striate or reticulate; impunctate near the mouth, but with many shallow setigerous depressions towards the scrobes. At the sides of the frons and on the vertex the puncturation is deeper and more even.

Thorax: the entire thoracic notum, except the apex of the scutellum and overlapping parts of the pronotum, show a thimble-like puncturation; the punctures generally equal and evenly disposed; those on the axillae the smallest, while the largest occur antero-medially on the mid lobe; between the punctures, the surface is very finely striate, rugose, or reticulate. Scutellum with a fine median furrow dying out at about one-half; vertical aspect of apex smooth; plate above metanotum with three flatly rounded, shallowly separated lobes; the median smallest. The sides of the pronotum are finely raised striate; mesepisternum smooth, shining; mesepimeron on the lower half, with one or two rows of large punctures with ridges between, but smooth above. Metapleurae rounded, swollen, with large, regularly disposed punctures.

Wings: length, 5 mm.; breadth over 1.75 mm. Submarginal: marginal: radius: post-marginal, in the ratio 16:5:3:6.

Hind legs: the coxa seven-eighths of the femur, which is greatly swollen (16:11), both shining, with minute, scattered punctures; the femur with eleven teeth; the basal very small and the five succeeding increasing in size; seven and eight larger, equal, and three in a clump at the apex.

Propodeon with a strong, median keel, bifurcating posteriorly at about one-half; within the forks are six cells (3, 3), round and above the petiole. The mid cell on each side is largest, and receives the irregular notopleural edge, between which and the central keel are five large, and two or three (anterior) small cells, and there are about eight cells on the pleurae behind the metapleurae. The spiracle, lying anteriorly behind the metapleurae, narrow, with straight inner, and broadly emarginate outer edge, is placed vertically and faces posteriorly.

Abdomen, including petiole (5:2), smooth, shining; the tergites with simple margins; the first covering two-thirds of the disk.

Length, 5.25 mm.; alar expanse nearly 12 mm.

BRIT. EAST AFRICA: Masai Reserve, 21. iv. 1913 (*T. J. Anderson*).

Type, a ♂ in the British Museum.

Hockeria munda, sp. nov.*

♀. Head, thorax and abdomen shining black, the abdominal tergites on the lower parts of their overlap, together with sternites iv. and v. and the junction of the sheath of the ovipositor with tergite vii., brown or reddish brown. Antennae castaneous on the scape and progressively darker towards the blackish club; with the junctions of the joints appearing as darker rings. Wings hyaline; fore coxae black; tegulae, mid and hind coxae, and all the legs brown, the anterior pairs brighter and more castaneous, the hind legs duller and with the tibiae somewhat infuscated. Pubescence everywhere brilliant silvery white.

* See figs. 1 and 2, pp. 382 and 383.

Head narrow and compressed, very wide (about 5:4), eyes separated by two diameters on the vertex; rather small, their base line cutting mid line at one-half. Frons not deeply excavated, hardly more than gently concave, as seen from above; post-scapal bare area narrow, facial and genal bristles longer towards the mouth-edge.

Antennae: length 3·4 mm.; very long and slender; scape swollen on basal half and narrow, with subparallel sides distally, except at the expanded apex; about sixteen times as long as broad; pedicel a little over one-third of the scape, with the breadth between one-fourth and one-sixth of the length; very much longer than the second funicular (first after the normally developed ring joint), after which the antenna is a little expanded. Club narrower than the last funicular joint. Proportions after the scape:—34, 22, 20, 19, 18, 17, 16, 16, 16, and club, 22 (7:5:10). In the same ratio the breadth for the first four joints enumerated increases from 6 to 9. The succeeding four have a thickness of 10, which on the last funicular and club decreases to 8. There are four sensoria on the second funicular joint.

Thorax: all the sutures deep, with the areas delimited by them slightly swollen; punctures large (and therefore fewer than in *Stomatoceras*), each with a strong, somewhat flattened, longish bristle; integument between the punctures smooth. Pronotum rather long, anteriorly rounded, with the usual anterior ridge indicated only at the sides. Scutellum bidentate, narrow, shorter than mid lobe and pronotum combined, without sulcus, and so overhanging the propodeon that its broad approximated teeth are in line with the posterior teeth of the latter. Metapleurae entirely covered with stiff bristles, of which there are a few in front of the bare mid femoral impression; the latter with seven to eight transverse rugae.

Propodeon with two well-defined angles on each side behind the spiracle; the first narrow, the second broad, both a little upturned. At the middle of each of the inner ridges from the petiole to the spiracle there is a low upward projection; between the inner and the notopleural ridges are 8-6 quadrate cells. The large median cell, twice transversely divided, is flanked by two outer cells with similar divisions, and between these again and the inner ridge are 6-7 cells, of which that behind the median projection of the ridge is much the largest. The metapleura are swollen, and there are no well-defined lateral patches of bristles flanking the insertion of the petiole.

Fore wings over two and a half times as long as broad; length, 3·15 mm.; breadth, 1·15 mm. Submarginal: marginal: radius, as 26:5:1. There are only about twelve bristles on the long submarginal, below which, until near the uprise, the wing is quite bare; on the marginal (after the pustules) and radius combined there are twenty to twenty-three bristles, stouter and a little longer than any found elsewhere. The rest of the wing is evenly covered with similar short bristles which are slightly longer near the marginal. The bare longitudinal line occurring in most *Haltichellines* just below one-half is clearly indicated, but there are no scales anywhere. *Hind wings*: length, 2·3 mm.; breadth, 0·65 mm. Near the base the submarginal comes close to the costa, and here there are about twenty-five closely-set short bristles, and many more on the vein itself; there are about nine minute bristles in the frenulum.

Hind legs: femur much swollen; behind the major tooth are forty-nine denticles; apical tibial comb or fringe of over forty long bristles.

Abdomen narrow and long pointed, only three-quarters as broad as the thorax. First tergite short, its posterior margin cutting a line from the stylets to the petiole at one-third; second tergite markedly biconcave, one-third as long as the first; third tergite about one-half of the first; fourth tergite like the second; fifth and sixth a little shorter. The dorsal surface of the abdomen as a whole very smooth; 7-8 stiff bristles from punctures at the side of tergite i.; on tergite ii., the overlaps bear numerous similar bristles in 5-6 rows; tergites iii. and iv. have each one row, and tergite v. two rows; tergite vi. is basally bare, but with the distal two-thirds closely set with bristles. The projecting part of the sheath is shorter than the ridge on tergite vii.

Length, $5\frac{1}{2}$ mm.; alar expanse, 8 mm.

NYASALAND: Lake Nyasa, Monkey Bay, 27.v.15 (*Dr. W. A. Lamborn*).

Type, a ♀ in the British Museum.

Through the courtesy of the Curator of the Albany Museum (Mr. J. Hewitt) I have been able to examine the type of *Hockeria melanaria*, Cam. (Rec. Albany Mus., i, p. 314, 1905). This species, which is correctly placed, may be told at once from *H. munda* by the legs, which are entirely black, except on the knees, and obscurely on the last tarsal joints. The mid femoral pleural impression in *H. melanaria* bears about fourteen fine ridges.

***Ooencyrtus lamborni*, sp. nov.** (figs. 5, 6).

♀. Head, prothorax, mesonotum and pleurae shining, blackish; the scutellum concolorous with the rest of the thorax, but dull, except at the tip, though somewhat refringent when highly magnified and in strong sunlight. Apex of scutellum shining,

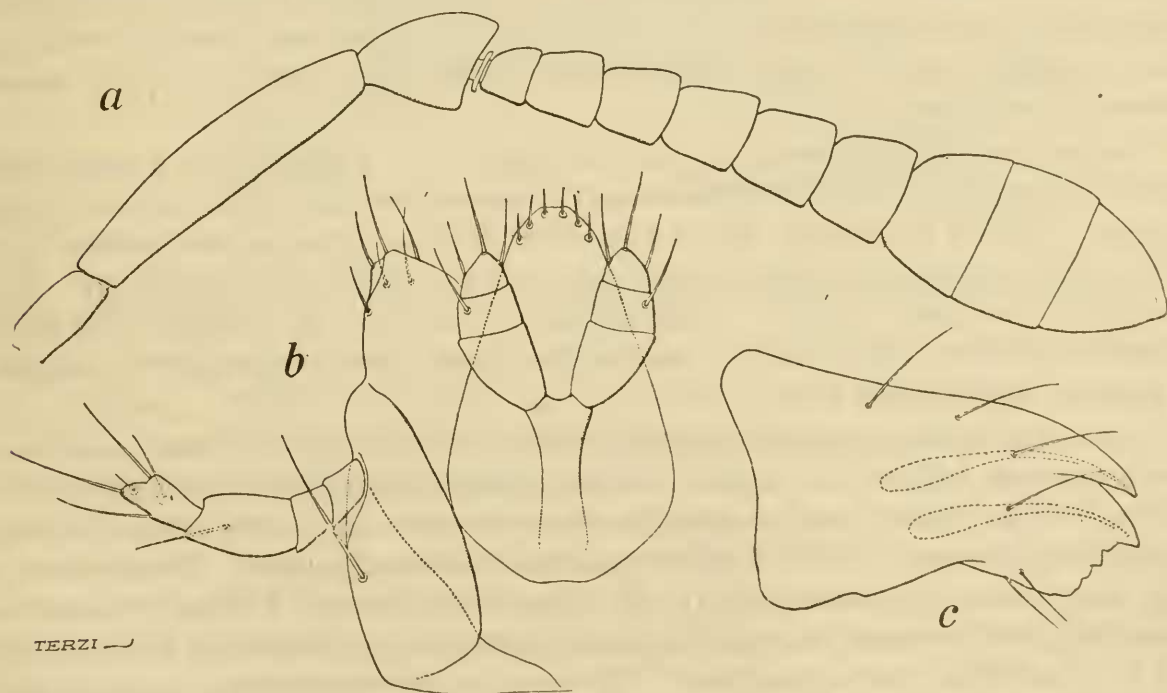


Fig. 5. *Ooencyrtus lamborni*, sp. n., ♀; *a*, antenna; *b*, trophi; *c*, mandible.

blue-black; there is a trace of the same colour in the reflections of the malar space. Propodeon blackish brown; the abdomen lighter, pale. Wings hyaline; nervures light brown. Legs and antennae pale, the funicle a little smoky.

Head as broad as deep; eyes with extremely short but regular pubescence; not so approximated as in *O. pacificus*;* separated by more than an eye diameter, or rather more than one-third of the greatest width of the head. Base line of the eyes two and a quarter times the distance across the vertex. Scrobes triangular, but not so narrow as in *pacificus*, and drawn out transversely, not vertically as in that species; clypeal edge medianly straight. Pattern more distinct than in *pacificus*, but not strong enough to cause any dulness. The rows of bristles between the scrobes are divergent towards the mouth, and there are three or four bristles at each side before the genal ridge.

Antennae (fig. 5, *a*): scape narrow, with subparallel sides. Pedicel stout and short (three-eighths of the scape); barely longer than deep. Funicle: 5, 7, 8, 9, 10, 10—all the joints transverse. Club: 1, 1, 1,—much swollen; about twice as broad as the last or four times the first funicular joint. Length of antenna, 0.35 mm.

Mouth-parts (fig. 5, *b*): labrum straight-edged; maxillary palpus, 4, 4, 6, 4; the second segment widest and the fourth narrowest; one bristle on the third, and four on the fourth segments respectively. Labial palpus: 5, 2, 3. *Mandible* (fig. 5, *c*) with an outer tooth, stout and deeply cleft from an inner, above and within which the apex of the mandible is straight (minutely, feebly denticulate, under one-sixth objective, with no. 4 eyepiece). The apical and upper edges meet in rather over a right angle.

Thorax: the pattern on the pronotum is coarse, and there is no alternating row of weaker bristles before the usual posterior row; the mesonotal pattern coarse, but not appreciably raised; on the scutellum, however, the reticulation is both coarse and raised; less so on the axillae. There are fewer bristles all over than in *pacificus*; about thirty before the suture, two to three on the axillae, and eleven to twelve on the scutellum; on the pleurae the pattern is distinct and practically all the sternal surface is reticulate.

Fore wings (7:3) broader than in *pacificus* (fig. 6, *a*); marginal vein a mere point. Radius long, (fig. 6, *b*) with one bristle and a distinct bare area from in front to well behind. Behind the hairless line is a patch of about a dozen minute bristles; the rest of the basal triangle being bare, except for a row below the submarginal. Submarginal: marginal: radius: postmarginal, as 20:1:3:2. Length, 0.63 mm.; breadth, 0.27 mm. *Hind wings*: the marginal bears three bristles above. Length, 0.4 mm.; breadth, 0.1 mm.

Legs: the tarsal proportions are practically as in *pacificus*; coxae more bare, fore coxa with bristles, 2-3 apical, 2-3 along anterior edge, 8-9 external, and one above coxa on inside; mid coxae with about the same number of external bristles as in the fore coxae. Tibiae hardly expanded; sides subparallel. Tarsal teeth or peg-like spines less numerous (fig. 6, *c*). One or two stronger bristles at the upper apical angle of the tarsal joints and only a few scattered on the surface of the fifth joint, not as in *pacificus*, with regular rows. The claws are more robust than in *pacificus*.

Propodeon: both sides smooth with one or two rugae behind the spiracle.

Abdomen: the transverse bands on the tergites are continuous, and not pale medianly as in *pacificus*; while behind the stylets, there is one row of bristles less.

* Bull. Ent. Res., vi, p. 307, 1915.

Ovipositor with the free portion of the sheath long, narrow, three-sevenths of the base, with five ventral hairs from one-third to the apex, and about the same number on the sides.

Length, 0.6 mm.; alar expanse, 1.4 mm.

♂. Like the ♀, with darker antennae, and the abdominal tergites almost as dark as the propodeon; near the base, the abdomen is paler.

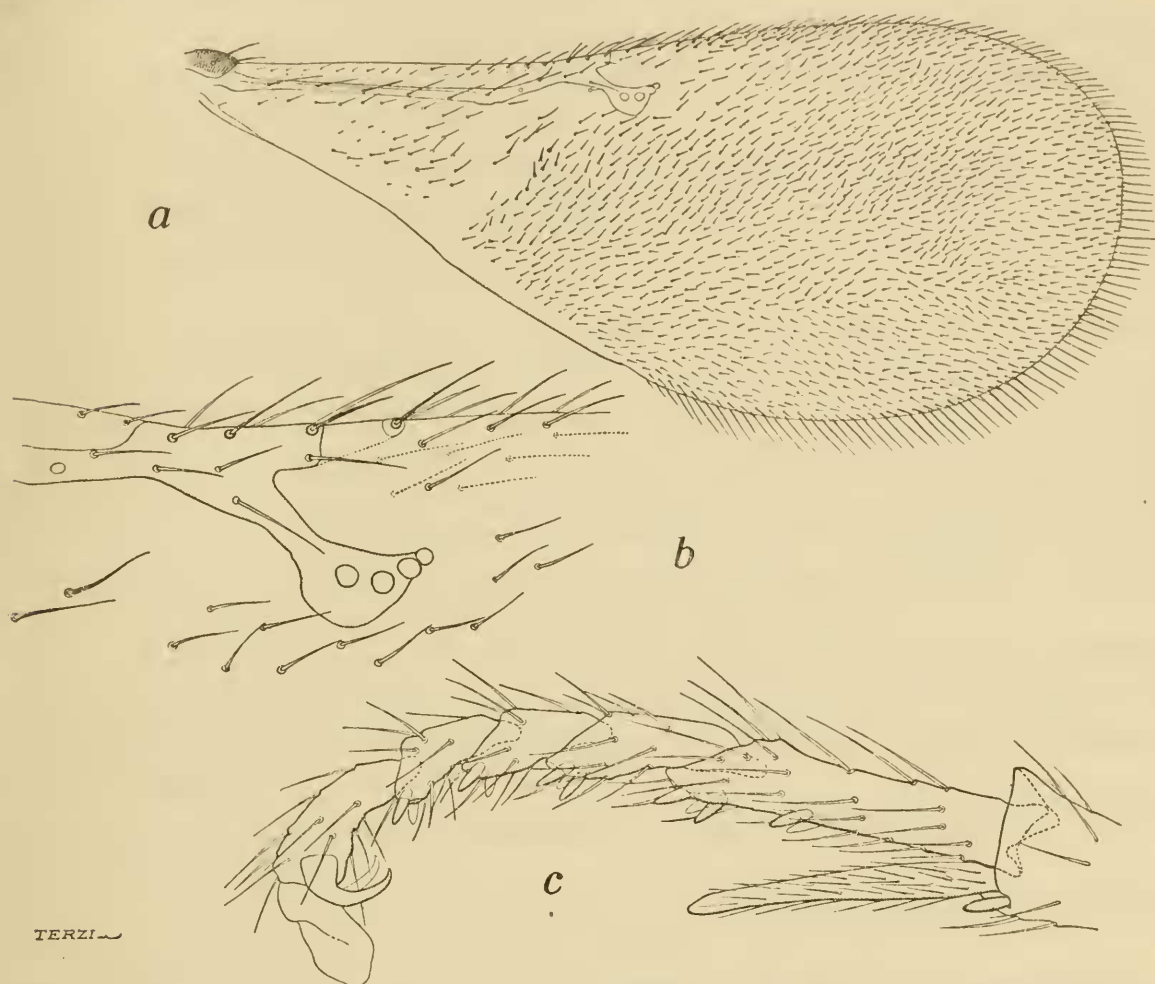


Fig. 6. *Ooencyrtus lamborni*, sp. n., ♀; a, right wing; b, radius; c, right mid tarsus.

Antennae: length, 0.5 mm. Scape (5:1) narrow; pedicel (3:2) one-third of scape, stouter; funicle cylindrical, the joints subequal; 1 being the shortest. The club is about twice as long as the last funicular joint and only a little wider. Thorax with one or two additional bristles on the mid lobe and scutellum, the sculpture being coarse as in the ♀. Dimensions much as in the ♀, the expanse nearly 1.5 mm. As the abdomen is generally telescoped and somewhat shrivelled in small Encyrtids, the apparent length of the species varies greatly. In *O. lamborni* there is a range of from 0.56 mm. (dry mount) to 0.72 mm. (mount in balsam after potashing), but the expanse is much more constant.

NYASALAND: Lake Nyasa, Monkey Bay, 12.v.1915 (*Dr. W. A. Lamborn*).

Type, a ♀ in the British Museum.

One of a series of 6 ♂♂ and 11 ♀♀, bred from eggs of a Pierine butterfly (*Belenois severina*, Cram.).